BRUHATH BANGALORE MAHANAGARA PALIKE

Name of the Agency : **Technical Manager,** KRIDL, Bangalore.

Name of the Work : Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.

Estimate Cost :

QUALITY CONTROL REPORTS TO

ASST. EXECUTIVE ENGINEER
Shettyhalli Sub Division,
BBMP, Bangalore.

CIVIL-TECH CONSULTANTS & ENGINEERS

Building & Highway Material Testing Laboratory
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Basaveshwaranagar, Bangalore – 560 079.

QUALITY CONTROL REPORTS FOR

GRANUALAR SUB BASE (GSB)

CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

Job No.: CTCE/BBMP/KRIDL/W.No.12/GSB-1/GR/2015-16 Date : 24.04.2015

GRADATION FOR GSB-I (CLOSE GRADED)
IS: 2720 (Part 4)

Customer : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of work : Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.

Reference : BBMP/AEE/SSD/DZ/PR/2015-16

Date of Testing : 24.04.2015

Sample Source : GSB Mix Plant Bangalore. **Oven Dry Wt (gm) :** 25500

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Specified Limits
75.0	0	0	0.00	0	100
53.0	980	980	3.84	96.16	80-100
26.50	6230	7210	28.27	71.73	55-90
9.50	4675	11885	46.61	53.39	35-65
4.75	3120	15005	58.84	41.16	25-55
2.36	2365	17370	68.12	31.88	20-40
0.425	4585	21955	86.10	13.90	10-25
0.075	2360	24315	95.35	4.65	3-10
PAN	1185				
Total	25500				

Remarks: Satisfies MORTH Specifications as per Table 400-1, Grading I

Note:

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3. Any Query regarding the report must be reported within 30 days from the date of testing.

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AE-12

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಶೆಟ್ಟಿಹಳ್ಳಿ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ವಲಯ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್.ಎಂ ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು.

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Bangalore-560079.

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Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

Job No.: CTCE/BBMP/KRIDL/W.No.12/GSB-1/AL/2015-16 Date : 24.04.2015

ATTERBERG LIMITS TEST FOR GSB (CLOSE GRADED)
IS : 2720 (Part - 5)

Client : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of work : Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.

Reference : BBMP/AEE/SSD/DZ/PR/2015-16

Date of Testing : 24.04.2015

As per MORTH Table : 400-11

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit, %	22.50	25.0% Maximum.
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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QUALITY CONTROL REPORTS FOR

WET MIX MACADAM (WMM)

CIVIL-TECH CONSULTANTS AND ENGINEERS

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NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

Job No.: CTCE/BBMP/KRIDL/W.No.12/WMM/Gradation/2015-16

30.04.2015

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of Work : Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.

Reference : BBMP/AEE/SSD/DZ/PR/2015-16

Date of Testing : 30.04.2015

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **25600**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	990	990	3.9	96.1	95-100
22.4	5260	6250	24.4	75.6	60-80
11.2	5485	11735	45.8	54.2	40-60
4.75	4720	16455	64.3	35.7	25-40
2.36	3635	20090	78.5	21.5	15-30
0.600	2240	22330	87.2	12.8	8-22
0.075	2250	24580	96.0	4.0	0-8

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Ke-12
ಸಹಾಯಕ ಕಾರ್ಯನಿರ್ವಾಹಕ ಅಭಿಯಂತರರು
ಶೆಟ್ಟಿಹಳ್ಳಿ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ವಲಯ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್.ಎಂ ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು.

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Job No.: CTCE/BBMP/KRIDL/W.No.12/WMM/AIV/2015-16 30.04.2015

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	30.04.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	383	390	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	86.5	84	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	296.5	306	
4	Aggregate Impact value = percent fines	22.58	21.54	
	100* (W_2/W_1)%			22.06

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Note:

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ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಶೆಟ್ಟಿಹಳ್ಳಿ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ವಲಯ
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ಎಸ್.ಎಂ ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು.

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CIVIL-TECH CONSULTANTS AND ENGINEERS

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Job No.: CTCE/BBMP/KRIDL/W.No.12/WMM/S-T/2015-16 30.04.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Work	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	30.04.2015

Result : Flakiness Index = **12.85%**

Elongation Index = **13.64%**

Result : Combined Flakiness & Elongation index **26.49%**

Comments:

→ Maximum allowable Flakinee & Elongation Index for Wet Mix Macadam is 30%

Note:

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W.No.12
30/4

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
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Job No.: CTCE/BBMP/KRIDL/W.No.12/WMM/AL/2015-16

30.04.2015

ATTERBERG LIMITS TEST FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of Work : Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.

Reference : BBMP/AEE/SSD/DZ/PR/2015-16

Date of Testing : 30.04.2015

Material : WMM

Sample Location : WMM Mix Plant

As per MORTH Table 400-11

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit, %	23.50	25.0% Maximum.
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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AE - 12
ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಶೆಟ್ಟಿಹಳ್ಳಿ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ವಲಯ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್.ಐ.ಒ ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು.

QUALITY CONTROL REPORTS FOR

BITUMINOUS MACADAM

CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/KRIDL/W.No.12/CSR.05/833d/BM(QB)/2015-16 06.05.2015

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

* CUSTOMER	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
* AGENCY	:	**Technical Manager,** KRIDL, Bangalore.
* NAME OF PROJECT	:	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	:	BBMP/AEE/SSD/DZ/PR/2015-16
SAMPLE ID	:	Bitumen
SAMPLE RECEIVED ON	:	06.05.2015
DATE OF TESTING	:	06.05.2015

The results of the tests conducted on the bitumen sample for Bituminous Macadam are as follows:

Sl.No	Description	Technical Reference	Test Result	Requirement as per IS: 73-2013
1	Penetration at 25^{0}C, 100g, 5 Sec 1/10 mm	IS: 1203-1978 (RA-2009)	66.0	60 to 70
2	Softening point, ^{0}C	IS: 1205-1978 (RA-2009)	47.0	Min. 45
3	Ductility at 27^{0}C, cm	IS: 1208-1978 (RA-2009)	100 >	Min. 50
4	Flash Point, ^{0}C	IS: 1209-1978 (RA-2009)	294	Min. 220

*Information is furnished by the Customer/Representative.

Civil-Tech Consultants & Engineers Bangalore

Note:

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K6-12
ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
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ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್.ಎಂ ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು.

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BM/AIV/2015-16 06.05.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Project	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Source / Location	Hotmix Plant, Bangalore
Type of Mix	Bituminous Macadam
Date of Testing	06.05.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	383	388	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	87	85.5	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	296	302.5	
4	Aggregate Impact value = percent fines	22.72	22.04	
	100* (W_2/W_1)%			22.38

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Macadam is 30%

Note:

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ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಶೆಟ್ಟಿಹಳ್ಳಿ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ವಲಯ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್.ಎಂ. ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು.

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BM/AIV/2015-16

06.05.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Project	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Source / Location	Hotmix Plant, Bangalore
Type of Mix	Bituminous Macadam
Date of Testing	06.05.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	387	386.5	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	88	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	305	298.5	
4	Aggregate Impact value = percent fines	21.19	22.77	
	100* (W_2/W_1)%			21.98

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Macadam is 30%

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ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
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Job No.: CTCE/BBMP/KRIDL/W.No.12/BM/Shape.T/2015-16 : 07.05.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager,** KRIDL, Bangalore.
Name of Project	: Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: BBMP/AEE/SSD/DZ/PR/2015-16
Technical Reference	: IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	: Bituminious Macadum
Date of Testing	: 07.05.2015

Flakiness Index = **11.75%**

Elongation Index = **13.84%**

Result : Combined Flakiness & Elongation index **25.59%**

Comments:

→ Maximum allowable Flakinee & Elongation Index for Bituminous Macadam is 30%

Note:

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ಶೆಟ್ಟಿಹಳ್ಳಿ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ವಲಯ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್.ಎಂ ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು.

CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

Job No.: CTCE/BBMP/KRIDL/W.No.12/BM/Shape.T/2015-16 : 07.05.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager,** KRIDL, Bangalore.
Name of Project	: Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: BBMP/AEE/SSD/DZ/PR/2015-16
Technical Reference	: IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	: Bituminious Macadum
Date of Testing	: 07.05.2015

Flakiness Index = **12.63%**

Elongation Index = **13.92%**

Result : Combined Flakiness & Elongation index **26.55%**

Comments:

→ Maximum allowable Flakinee & Elongation Index for Bituminous Macadam is 30%

Note:

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AE-12
ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಶೆಟ್ಟಿಹಳ್ಳಿ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ವಲಯ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್.ಎಂ ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು.

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BM/Stripping/2015-16 11.05.2015

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Project	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Type of Mix	Bituminous Macadam
Date of Testing	11.05.2015

Type of binder : 60/70
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.4	3.23	96.77
2	3.1		
3	3.2		

Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Macadam is 95%

Note:

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AE-II

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
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Bangalore-560079.

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BM/Sp_Wa/2015-16 11.05.2015

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Project	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Source / Location	Hotmix Plant, Bangalore.
Type of Mix	Bituminous Macadam
Date of Testing	11.05.2015

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2025	2023	2024	
2	Weight of basket suspended in water	W_2 g	750	750	750	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1275	1273	1274	
4	Weight of saturated surface dry aggregate in air	W_3 g	2020	2021	2018	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	745	748	744	
6	Weight of oven dried aggregate	W_4 g	2005	2007	2002	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.691	2.683	2.691	2.691
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.747	2.734	2.750	2.748
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.75%	0.70%	0.80%	0.77%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Macadam is 2.0%

Note:

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E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BM/Bitumen/2015-16 11.05.2015

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MACADAM MIX

As Per IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager,** KRIDL, Bangalore.
NAME OF PROJECT	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/AEE/SSD/DZ/PR/2015-16
SAMPLE I/D	Roads in Vinayaka Layout W.No.12
DATE OF TESTING	11.05.2015

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	483	482
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	17	18.00
7. Bitumen content in %	3.40	3.60
8. Average	**3.50**	

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AE-12
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Job No.: CTCE/BBMP/KRIDL/W.No.12/BM/Bitumen/2015-16 11.05.2015

GRADATION DETERMINATION OF BITUMINOUS MACADAM MIX

As Per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager,** KRIDL, Bangalore.
NAME OF PROJECT	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/AEE/SSD/DZ/PR/2015-16
SAMPLE I/D	Roads in Vinayaka Layout W.No.12
DATE OF TESTING	11.05.2015

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-04 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
26.5	0	0	0	100	100
19	34.25	7.09	7.09	92.91	90-100
13.2	127.2	26.34	33.43	66.57	56-88
4.75	226.3	46.85	80.28	19.72	16-36
2.36	65.82	13.63	93.91	6.09	4-19
0.3	11.47	2.37	96.28	3.72	2-10
0.075	4.25	0.88	97.16	2.84	0-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-04 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
26.5	0	0	0	100	100
19	34.58	7.17	7.17	92.83	90-100
13.2	126.5	26.24	33.42	66.58	56-88
4.75	223.7	46.41	79.83	20.17	16-36
2.36	61.58	12.78	92.61	7.39	4-19
0.3	10.23	2.12	94.73	5.27	2-10
0.075	4.96	1.03	95.76	4.24	0-8

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BM/Agg.G/2015-16 11.05.2015

Aggregate Gradation Test

IS : 2386 Part I

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Project	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Sample ID	Hotmix Plant, Bangalore.
Type of Mix	Bituminous Macadam
Date of Testing	11.05.2015

Total Weight of Sample: 5350 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
26.5	0	0	0	100	100	Gradation satisfies Grade-II MORTH specification
19	422	7.89	7.89	92.11	90-100	
13.2	1685	31.50	39.38	60.62	56-88	
4.75	1474	27.55	66.93	33.07	16-36	
2.36	915	17.10	84.04	15.96	4-19	
0.3	385	7.20	91.23	8.77	2-10	
0.075	212	3.96	95.20	4.80	0-8	

Total Weight of Sample: 5400 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
26.5	0	0	0	100	100	Gradation satisfies Grade-II MORTH specification
19	292	5.41	5.41	94.59	90-100	
13.2	1742	32.26	37.67	62.33	56-88	
4.75	1586	29.37	67.04	32.96	16-36	
2.36	847	15.69	82.72	17.28	4-19	
0.3	523	9.69	92.41	7.59	2-10	
0.075	184	3.41	95.81	4.19	0-8	

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QUALITY CONTROL REPORTS FOR

BITUMINOUS CONCRETE

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T-2377

Job No.: CTCE/BBMP/KRIDL/W.No.12/CSR.05/833d/BC(QB)/2015-16 07.05.2015

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

* CUSTOMER	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
* AGENCY	:	**Technical Manager,** KRIDL, Bangalore.
* NAME OF PROJECT	:	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	:	BBMP/AEE/SSD/DZ/PR/2015-16
SAMPLE ID	:	Bitumen
SAMPLE RECEIVED ON	:	07.05.2015
DATE OF TESTING	:	07.05.2015

The results of the tests conducted on the Bitumen sample for Bituminous Concrete are as follows:

Sl.No	Description	Technical Reference	Test Result	Requirement as per IS: 73-2013
1	Penetration at 25^{0}C, 100g, 5 Sec 1/10 mm	IS: 1203-1978 (RA-2009)	67.0	60 to 70
2	Softening point, ^{0}C	IS: 1205-1978 (RA-2009)	48.0	Min. 45
3	Ductility at 27^{0}C, cm	IS: 1208-1978 (RA-2009)	100 >	Min. 50
4	Flash Point, ^{0}C	IS: 1209-1978 (RA-2009)	286	Min. 220

*Information is furnished by the Customer/Representative.

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AE - 12

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
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ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
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T-2377

Job No.: CTCE/BBMP/KRIDL/W.No.12/CSR.05/833d/BC(QB)/2015-16 07.05.2015

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

* CUSTOMER	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
* AGENCY	:	**Technical Manager,** KRIDL, Bangalore.
* NAME OF PROJECT	:	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	:	BBMP/AEE/SSD/DZ/PR/2015-16
SAMPLE ID	:	Bitumen
SAMPLE RECEIVED ON	:	07.05.2015
DATE OF TESTING	:	07.05.2015

The results of the tests conducted on the Bitumen sample for Bituminous Concrete are as follows:

Sl.No	Description	Technical Reference	Test Result	Requirement as per IS: 73-2013
1	Penetration at 25^{0}C, 100g, 5 Sec 1/10 mm	IS: 1203-1978 (RA-2009)	62.0	60 to 70
2	Softening point, ^{0}C	IS: 1205-1978 (RA-2009)	47.0	Min. 45
3	Ductility at 27^{0}C, cm	IS: 1208-1978 (RA-2009)	100 >	Min. 50
4	Flash Point, ^{0}C	IS: 1209-1978 (RA-2009)	304	Min. 220

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BC/AIV/2015-16 07.05.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Project	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	07.05.2015

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	379	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	79	82	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	20.84	21.47	**21.16**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BC/AIV/2015-16 07.05.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Project	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	07.05.2015

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	379	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	293	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	21.47	22.69	**22.08**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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AG - 12

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BC/AIV/2015-16 07.05.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Project	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	07.05.2015

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	385	384	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	301	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	21.82	21.61	**21.72**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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AE-12

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಶೆಟ್ಟಿಹಳ್ಳಿ ಶಿಕ್ಷಕವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ವಲಯ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್.ಎಂ ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು.

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BC/AIV/2015-16 07.05.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Project	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	07.05.2015

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	384	391	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	87	82	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	297	309	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	22.66	20.97	**21.81**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BC/AIV/2015-16 07.05.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Project	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	07.05.2015

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	388	382.5	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	304	295.5	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	21.65	22.75	**22.20**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BC/Shape.T/2015-16 : 08.05.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager,** KRIDL, Bangalore.
Name of Project	: Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: BBMP/AEE/SSD/DZ/PR/2015-16
Technical Reference	: IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	: Bituminous Concrete
Date of Testing	: 08.05.2015

Result : Flakiness Index = **11.47%**

Elongation Index = **13.89%**

Result : Combined Flakiness & Elongation index **25.36%**

Note:

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DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager,** KRIDL, Bangalore.
Name of Project	: Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: BBMP/AEE/SSD/DZ/PR/2015-16
Technical Reference	: IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	: Bituminous Concrete
Date of Testing	: 08.05.2015

Result : Flakiness Index = **12.85%**

Elongation Index = **13.67%**

Result : Combined Flakiness & Elongation index **26.52%**

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DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager,** KRIDL, Bangalore.
Name of Project	: Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: BBMP/AEE/SSD/DZ/PR/2015-16
Technical Reference	: IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	: Bituminous Concrete
Date of Testing	: 08.05.2015

Result : Flakiness Index = **11.85%**

Elongation Index = **13.63%**

Result : Combined Flakiness & Elongation index **25.48%**

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BC/Shape.T/2015-16 : 08.05.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager,** KRIDL, Bangalore.
Name of Project	: Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: BBMP/AEE/SSD/DZ/PR/2015-16
Technical Reference	: IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	: Bituminous Concrete
Date of Testing	: 08.05.2015

Result : Flakiness Index = **11.84%**

Elongation Index = **13.57%**

Result : Combined Flakiness & Elongation index **25.41%**

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BC/Shape.T/2015-16 : 08.05.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager,** KRIDL, Bangalore.
Name of Project	: Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: BBMP/AEE/SSD/DZ/PR/2015-16
Technical Reference	: IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	: Bituminous Concrete
Date of Testing	: 08.05.2015

Result : Flakiness Index = **12.42%**

Elongation Index = **13.84%**

Result : Combined Flakiness & Elongation index **26.26%**

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BC/Stripping/2015-16 12.05.2015

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Project	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Type of Mix	Bituminous Concrete
Date of Testing	12.05.2015

Type of binder : 60/70
Percentage of binder used : 5.00% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.00 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.4	3.37	96.63
2	3.2		
3	3.5		

Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BC/Sp_Wa/2015-16 13.05.2015

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Project	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Type of Mix	Bituminous Concrete
Date of Testing	13.05.2015

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2018	2020	2019	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1263	1265	1264	
4	Weight of saturated surface dry aggregate in air	W_3 g	2023	2025	2026	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	760	760	762	
6	Weight of oven dried aggregate	W_4 g	2008	2012	2009	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.642	2.647	2.636	2.642
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.695	2.693	2.697	2.695
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.75%	0.65%	0.85%	0.75%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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JobNo: CTCE/BBMP/KRIDL/W.No.12/BC/Bitumen/2015-16 12.05.2015

BITUMEN CONTENT DETERMINATION OF BITUMINOUS CONCRETE MIX

As Per IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager,** KRIDL, Bangalore.
NAME OF PROJECT	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/AEE/SSD/DZ/PR/2015-16
SAMPLE I/D	Roads in Vinayaka Layout W.No.12
DATE OF TESTING	12.05.2015

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	474	473.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	26	26.50
7. Bitumen content in %	5.20	5.30
8. Average	**5.25**	

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JobNo: CTCE/BBMP/KRIDL/W.No.12/BC/Bitumen/2015-16 12.05.2015

GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

AS PER IS2386 & IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager,** KRIDL, Bangalore.
NAME OF PROJECT	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/AEE/SSD/DZ/PR/2015-16
SAMPLE I/D	Roads in Vinayaka Layout W.No.12
DATE OF TESTING	12.05.2015

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	65.87	13.90	13.90	86.10	79-100
9.5	52.39	11.05	24.95	75.05	70-88
4.75	84.32	17.79	42.74	57.26	53-71
2.36	65.98	13.92	56.66	43.34	42-58
1.18	38.62	8.15	64.81	35.19	34-48
0.6	32.87	6.93	71.74	28.26	26-38
0.3	42.13	8.89	80.63	19.37	18-28
0.15	28.75	6.07	86.69	13.31	12-20
0.075	37.24	7.86	94.55	5.45	4-10

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	64.53	13.63	13.63	86.37	79-100
9.5	51.78	10.94	24.56	75.44	70-88
4.75	85.69	18.10	42.66	57.34	53-71
2.36	66.38	14.02	56.68	43.32	42-58
1.18	36.47	7.70	64.38	35.62	34-48
0.6	33.58	7.09	71.47	28.53	26-38
0.3	41.98	8.87	80.34	19.66	18-28
0.15	27.46	5.80	86.14	13.86	12-20
0.075	38.97	8.23	94.37	5.63	4-10

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CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

JobNo: CTCE/BBMP/KRIDL/W.No.12/BC/Bitumen/2015-16 13.05.2015

BITUMEN CONTENT DETERMINATION OF BITUMINOUS CONCRETE MIX

As Per IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager,** KRIDL, Bangalore.
NAME OF PROJECT	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/AEE/SSD/DZ/PR/2015-16
SAMPLE I/D	Roads in Vinayaka Layout W.No.12
DATE OF TESTING	13.05.2015

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	473
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	27.00
7. Bitumen content in %	5.00	5.40
8. Average	**5.20**	

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AE-12

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಶೆಟ್ಟಿಹಳ್ಳಿ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ವಲಯ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್.ಎಂ ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು.

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JobNo: CTCE/BBMP/KRIDL/W.No.12/BC/Bitumen/2015-16 13.05.2015

GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

AS PER IS2386 & IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager,** KRIDL, Bangalore.
NAME OF PROJECT	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/AEE/SSD/DZ/PR/2015-16
SAMPLE I/D	Roads in Vinayaka Layout W.No.12
DATE OF TESTING	13.05.2015

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	46.58	9.81	9.81	90.19	79-100
9.5	32.47	6.84	16.64	83.36	70-88
4.75	73.15	15.40	32.04	67.96	53-71
2.36	86.54	18.22	50.26	49.74	42-58
1.18	63.28	13.32	63.58	36.42	34-48
0.6	37.48	7.89	71.47	28.53	26-38
0.3	33.26	7.00	78.48	21.52	18-28
0.15	28.49	6.00	84.47	15.53	12-20
0.075	36.15	7.61	92.08	7.92	4-10

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	45.87	9.70	9.70	90.30	79-100
9.5	44.15	9.33	19.03	80.97	70-88
4.75	73.62	15.56	34.60	65.40	53-71
2.36	65.48	13.84	48.44	51.56	42-58
1.18	72.14	15.25	63.69	36.31	34-48
0.6	43.26	9.15	72.84	27.16	26-38
0.3	35.28	7.46	80.30	19.70	18-28
0.15	29.68	6.27	86.57	13.43	12-20
0.075	27.45	5.80	92.37	7.63	4-10

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BC/Agg/2015-16 12.05.2015

Aggregate Gradation Test

IS : 2386 Part I

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Project	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	12.05.2015

Total Weight of Sample: **5250** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	548	10.44	10.44	89.56	79 - 100	
9.5	532	10.13	20.57	79.43	70 - 88	
4.75	715	13.62	34.19	65.81	53 - 71	
2.36	621	11.83	46.02	53.98	42 - 58	
1.18	608	11.58	57.60	42.40	34 - 48	
0.600	658	12.53	70.13	29.87	26 - 38	
0.300	565	10.76	80.90	19.10	18 - 28	
0.150	367	6.99	87.89	12.11	12 - 20	
0.075	345	6.57	94.46	5.54	4 - 10	

Total Weight of Sample: **5150** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	542	10.52	10.52	89.48	79 - 100	
9.5	530	10.29	20.82	79.18	70 - 88	
4.75	724	14.06	34.87	65.13	53 - 71	
2.36	615	11.94	46.82	53.18	42 - 58	
1.18	597	11.59	58.41	41.59	34 - 48	
0.600	648	12.58	70.99	29.01	26 - 38	
0.300	485	9.42	80.41	19.59	18 - 28	
0.150	323	6.27	86.68	13.32	12 - 20	
0.075	337	6.54	93.22	6.78	4 - 10	

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Job No.: CTCE/BBMP/KRIDL/W.No.12/BC/Agg/2015-16 13.05.2015

Aggregate Gradation Test

IS : 2386 Part I

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Project	Improvements to Vinayaka Layout and Medarahalli Govt. School backside area in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2015-16
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	13.05.2015

Total Weight of Sample: **5450** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	542	9.94	9.94	90.06	79 - 100	
9.5	587	10.77	20.72	79.28	70 - 88	
4.75	764	14.02	34.73	65.27	53 - 71	
2.36	755	13.85	48.59	51.41	42 - 58	
1.18	526	9.65	58.24	41.76	34 - 48	
0.600	636	11.67	69.91	30.09	26 - 38	
0.300	526	9.65	79.56	20.44	18 - 28	
0.150	309	5.67	85.23	14.77	12 - 20	
0.075	410	7.52	92.75	7.25	4 - 10	

Total Weight of Sample: **5500** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	762	13.85	13.85	86.15	79 - 100	
9.5	557	10.13	23.98	76.02	70 - 88	
4.75	685	12.45	36.44	63.56	53 - 71	
2.36	483	8.78	45.22	54.78	42 - 58	
1.18	688	12.51	57.73	42.27	34 - 48	
0.600	584	10.62	68.35	31.65	26 - 38	
0.300	565	10.27	78.62	21.38	18 - 28	
0.150	415	7.55	86.16	13.84	12 - 20	
0.075	364	6.62	92.78	7.22	4 - 10	

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